ELECTRICITY AND HEALTH.

Studies in Electro-pathology. By Temp. Major A. White Robertson. Illustrated. Pp. viii + 304. (London: George Routledge and Sons, Ltd., 1918.) Price 12*s.* 6*d.* net.

THIS book begins with the thesis that civilisation is a mistake because it is a negation of the "wild," the law of which is "Thou shalt be fit or thou shalt die." But we are justified in asking, What is "fitness"? The author appears to have left the development of the brain altogether out of consideration. Do music and painting count for nothing? The statement is made that "suffering has come with the law of the artificial"—that is, the civilised. If we are to accept this we must hold that all existences prior to civilisation were devoid of consciousness. Disease is certainly not absent from wild animals or men, and when the author says that it has increased enormously owing to civilisation, we must remember that the conditions producing it can and must be done away with, and this without abolishing civilisation itself. Moreover, is not the increase spoken of apparent merely and due to improved means of detection? It may be doubted whether the physician is the best judge as to the extent of the increase.

The conclusion of the book is that we must go back to the "law of the wild." How? By living in accordance with the theories of the essentially electrical nature of all physiological and pathological phenomena familiar to some of us in connection with the name of Mr. A. E. Baines. The effects of light are now added on account of their electrical nature. It is true that in the far distant future all phenomena may possibly be explained on the basis of the electrical structure of the atom; but no man living can do this, and the author's attempt can only be described as premature, a fact for which he cannot be held responsible. The book shows an extensive acquaintance with literature, although the quotations are apt to be rather disconnected and their relation to the argument not always obvious. The inner meaning attached to many of these quotations appears to be due to the electrical obsession of the author, who is not always consistent. On p. 57 he inclines to the view that enzymes are "forces"; on p. 115 he speaks of phosphorus as their essential factor, apparently, however, forgetting that a very active pepsin has been prepared free from phosphorus.

The reader must be warned against accepting without question the statements contained in the book. Mr. Baines's remarkable experimental results are quoted without criticism. No attempt is made to answer the objections that have been brought against them, and it is not to be expected that they will be believed until they have been described in such a way that others can repeat them. This applies especially to such experiments as that referred to on p. 231, where a boiled potato is made to sprout by the application of an electrical current. The electrical obsession is indicated also by the view taken that the function of the waxy or fatty layer on the surface of plants or animals is to prevent escape to the air of electrical charges.

The author holds the view that the constitution of "vitamines" is that of phospho-lipines, and his remarks about "quick" food must be referred to on account of the possible mischief that they may do. "Quick" food is that which has a particular electrical reaction, when tested by the method of Mr. Baines, on account of the presence of insulating lipoids. It is the only kind of food that is to be taken. Cold storage destroys this property, as also does over-cooking. But the remarks made as to the misleading nature of calorie values raise doubt as to the competence of the author to advise on problems of nutrition. The application of the theories to medical and surgical practice consists in the addition of a phospho-lipine, lecithin, or similar substance to Mr. Baines's "dielectric oil" or liquid paraffin.

W. M. B.

THE RADCLIFFE FOUNDATIONS.

Dr. John Radcliffe: A Sketch of his Life, with an Account of his Fellows and Foundations. By Dr. J. B. Nias. Pp. 147. (Oxford: At the Clarendon Press, 1918.) Price 12*s.* 6*d.* net.

DR. JOHN RADCLIFFE, a very successful Court physician at the time of William III. and Queen Anne, was one of the most generous of all the numerous benefactors of Oxford, for he left most of his large fortune to the University. He covenanted that a portion of it should be used to endow two travelling fellowships, to be held by Oxford medical graduates for the space of ten years, and he made a special proviso that at least half of this period should be spent by his fellows "in parts beyond the sea, for their better improvement." Radcliffe's idea was an excellent one, for few medical men could fail to broaden their outlook and increase their experience by visiting the most noted medical schools in foreign countries. At the same time the period of ten years is too long for most men, and so from 1859 onwards the tenure of the fellowships was reduced to three years. The list of fellows includes many distinguished names, and of those elected under the new foundation nearly twenty at the present moment hold appointments on the staff of one or other of the London hospitals. The book under review gives only brief records of living fellows, but detailed biographies of the deceased fellows of the old foundation.

The other foundations under Dr. Radcliffe's will include the imposing Radcliffe Library, or "Camera." For the first century or more after it was built this library was stored with books of all kinds, but from 1811 onwards they were restricted to scientific and medical subjects. In 1861 these science books were transferred to the recently built "Museum," whilst the library itself is now used as an annexe to the Bodleian Library.

Another notable foundation bearing Radcliffe's name is the observatory. This institution was not contemplated in Radcliffe's will, but it was founded in 1772 by the trustees out of the trust

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funds, at the request of leading members of the University. At the time of its erection the observatory was one of the largest and best-equipped in the world, and its equipment has been well maintained by the recent addition of a splendid telescope of 24-in. aperture for photographic work, and one of 18-in. aperture for visual work, on the same mounting. Just previous to the foundation of the observatory the trustees sanctioned the building of the Radcliffe Infirmary, which has ever since remained the chief county hospital.

In addition to a description of the Radcliffe foundations, Dr. Nias (himself an ex-travelling fellow) gives a brief but interesting biography of Radcliffe. The book contains numerous portraits and illustrations, and is beautifully printed and produced, but it is to be feared that its circulation will be limited by its somewhat excessive price.

H. M. V.

OUR BOOKSHELF.

Elements of the Electromagnetic Theory of Light. By Dr. Ludwik Silberstein. Pp. vii+48. (London: Longmans, Green, and Co., 1918.) Price 3*s.* 6*d.* net.

THIS little volume is re-written from the author's Polish treatise on electricity and magnetism (3 vols., Warsaw, 1908–13). It is a compact *résumé* of the main results of the electromagnetic theory of light in so far as it can be carried without reference to the electron theory. The main purpose seems to be to present the subject to the English reader in vectorial notation, following the symbolism of the author's "Vectorial Mechanics" (Macmillan, 1913). It would have added to the usefulness of a book designed for beginners in the subject if a short exposition of the meaning of the notation had been prefixed, an addition which would have helped to familiarise the rising generation with a very important calculus.

A useful historical survey of earlier æther-theories is given in the second chapter.

The Exploitation of Plants. By Various Writers. Edited by Prof. Oliver. (The Imperial Studies Series.) Pp. vii+170. (London: J. M. Dent and Sons, Ltd., 1917.) Price 2*s.* 6*d.* net.

PROF. OLIVER has done a useful piece of work in bringing together, within the compass of a small volume, a series of lectures on "The Exploitation of Plants in the Service of Man," which was delivered at University College, London, in 1917. In such a collection it is inevitable that there should be differences in relative values, but the standard of the best is very high. Amongst those which strike us as particularly good are the contributions of Prof. Oliver himself, and that of Dr. Willis, formerly director of the celebrated gardens at Peradeniya. As might perhaps have been anticipated, these are concerned with the reclamation of waste lands and with the rubber industry respectively. Both are characterised by first-hand knowledge and that indefinable but very real quality that attaches to pioneer work. Dr. Balls contributes a suggestive article on cotton and its problems, but here and there he is inclined, perhaps, to assume a more extensive technical acquaintance with the subject on the part of the reader than the latter could actually justify.

One essay is markedly egotistical, and the instructed reader will find some entertaining "information" in the lecture dealing with the plant as healer. Amongst other curious statements, the account therein given of the cinchona enterprise in Ceylon manages in a few lines to convey a thoroughly misleading impression of the causes which led to the collapse of that particular industry in the island.

But a book of this kind should, after all, be judged on its merits as a whole, and while it must be admitted to contain some dross, the greater part of it is good, and the best is really first-rate.

LETTERS TO THE EDITOR.

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The Perception of Sound.

I DO not think that Helmholtz's theory of audition, whatever difficulties there may be in it, breaks down so completely as Dr. Perrett represents (NATURE, November 7). According to him, one consequence of the theory would be that "when a tuning-fork is made to vibrate, no note can be heard, but only an unimaginable din." I cannot admit this inference. It is true that Helmholtz's theory contemplates the response in greater or less degree of a rather large number of "resonators" with their associated nerves, the natural pitch of the resonators ranging over a certain interval. But there would be no *dissonance*, for in Helmholtz's view dissonance depends upon intermittent excitation of nerves, and this would not occur. So long as the vibration is maintained, every nerve would be uniformly excited. Neither is there any difficulty in attributing a simple perception to a rather complicated nervous excitation. Something of this kind is involved in the simple perception of *yellow*, resulting from a combination of excitations which would severally cause perceptions of red and green.

The fundamental question would appear to be the truth or otherwise of the theory associated with the name of J. Müller. Whatever may be the difficulty of deciding it, the issue itself is simple enough. Can more than one kind of message be conveyed by a single nerve? Does the nature of the message depend upon how the nerve is excited? In the case of sound —say from a fork of frequency 256—is there anything periodic of this frequency going on in the nerve, or nerves, which carry the message? It is rather difficult to believe it, especially when we remember that frequencies up to 10,000 per second have to be reckoned with Even if we could accept this, what are we to think when we come to nerves conveying the sensation of light? Can we believe that there are processes in action along the nerve repeated 10^{15} times per second?

I do not touch upon the anatomical matters treated by Sir T. Wrightson and Prof. Keith, or upon the phonetic evidence brought forward with authority by Dr. Perrett.

RAYLEIGH.

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